General

Guideline Title

Guideline for minimally invasive surgery.

Bibliographic Source(s)

Fearon MC, Conner RL. Guideline for minimally invasive surgery. In: 2017 Guidelines for Perioperative Practice. Denver (CO): Association of periOperative Registered Nurses (AORN); 2016 Dec. p. 629-58. [164 references]

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

Note from the Association of periOperative Registered Nurses (AORN): The original guideline document provides guidance for creating a safe environment of care for patients undergoing minimally invasive surgical procedures. The guideline addresses distention media used during endoscopic procedures, hybrid operating rooms (ORs), magnetic resonance imaging (MRI) hybrid ORs, navigation-guided procedures, and robotic-assisted surgery. The document provides guidance to perioperative personnel to reduce risks to patients and perioperative team members during minimally invasive surgery (MIS) and computer-assisted technology procedures; perioperative registered nurses (RNs) to assist in managing distention media (e.g., gas, fluid) and irrigation fluid; and health care organizations for incorporating advancements in technology with consideration for workplace safety and ergonomics.

I. Health care organizations should establish a multidisciplinary team to create an efficient, safe environment for minimally invasive procedures.
II. Potential patient injuries and complications associated with gas insufflation media used during MIS procedures should be identified, and practices that reduce the risk for injuries and complications should be established.
III. The perioperative RN should identify potential injuries and complications associated with fluid used for irrigation or as distention media during MIS and computer-assisted procedures.
IV. Precautions should be taken to mitigate the risk for injury associated with the use of energy-generating devices during MIS.
V. The perioperative team should identify potential risks for injury and complications associated with computer-assisted surgical procedures and should implement safe practices.
VI. The health care organization should determine the requirements for the design and operation of the hybrid OR for surgical or invasive procedures.
VII. The health care organization should identify risks for injury and complications associated with intraoperative MRI procedures and establish safe practices regardless of magnet format or field strength.

VIII. Perioperative personnel should receive education and complete competency verification activities in the perioperative nursing care of patients who undergo MIS and computer-assisted procedures.
IX. Policies and procedures for MIS and computer-assisted procedures should be developed, reviewed periodically, revised as necessary, and readily available in the practice setting in which they are used.

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Any condition requiring minimally invasive surgery

Guideline Category

Prevention

Risk Assessment

Clinical Specialty

Nursing

Radiology

Surgery

Intended Users

Advanced Practice Nurses

Hospitals

Nurses

Guideline Objective(s)

To provide guidance for creating a safe environment of care for patients undergoing minimally invasive surgical procedures

Target Population

Patients undergoing minimally invasive surgical procedures and perioperative personnel

Interventions and Practices Considered

1. Establishing a multidisciplinary team to create an efficient, safe environment for minimally invasive procedures
2. Identifying and reducing the risk for potential patient injuries and complications associated with
    - Gas insufflation media

    - Fluid used for irrigation or as distention media
    - Use of energy-generating devices
    - Computer-assisted surgical procedures
    - Intraoperative magnetic resonance imaging (MRI) procedures
3. Determination of requirements for the design and operation of the hybrid operating room for surgical or invasive procedures
4. Education and competency verification activities in the perioperative nursing care of patients who undergo minimally invasive surgery (MIS) and computer-assisted procedures
5. Development and continued review of policies and procedures for MIS and computer-assisted procedures

Major Outcomes Considered

- Satisfaction with staff safety, patient safety, and efficiency
- Number and type of equipment- and instrument-related risk-sensitive events
- Events inside operating rooms that lengthen operative time
- Cardiopulmonary complications and procedure-related complications
- Physiological changes that could be attributed to gaseous embolism
- Intraoperative and postoperative levels of serum sodium, potassium, chloride, glucose and osmolality
- Amount of intra-operative fluid absorption
- Blood loss, postoperative pain levels, and complication rates
- Intraoperative error rates

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Evidence Review

In January 2016, a medical librarian conducted systematic searches of the databases MEDLINE®, CINAHL®, and Scopus® and the Cochrane Database of Systematic Reviews, limiting the results to articles published in English after 2009. During the development of this guideline, the lead author requested supplementary searches for topics not included in the original search as well as articles and other sources that were discovered during the evidence appraisal process. The lead author and the medical librarian also identified relevant guidelines from government agencies and standards-setting bodies.

Search terms included the subject headings and keywords *minimally invasive surgical procedures, robotic surgical procedures, angioscopy, morcellation, interventional magnetic resonance imaging, interventional radiography, interventional ultrasonography, angioplasty, endoscopy, cholangiography,* and*hybrid operating room*, as well as headings and keywords identifying specific procedures. Patient monitoring and procedural complications were addressed by headings and keywords that included *nursing assessment, intraoperative and postoperative complications, intraoperative and physiologic monitoring, fluid monitoring, insufflation, extravasation, pneumoperitoneum, intraabdominal pressure, TUR syndrome,* and *compartment syndrome*. Occupational risks related to minimally invasive surgery were included in the search with terms such as *human engineering, occupational injuries, ergonomics, musculoskeletal injuries,* and *occupational accidents*.

Excluded were non-peer-reviewed publications and lower-level or lower-quality evidence when higher-level or higher-quality evidence was available. Surgical techniques (e.g., open versus closed technique, trocar insertion, natural orifice technique, single-incision laparoscopic surgery) and anesthesia techniques (e.g., goal-directed fluid therapy), endoclip migration, future product development and applications, equipment prototypes, enhanced recovery after surgery, dental navigation-guided surgery, and gastrointestinal endoscopy procedures also were excluded.

Number of Source Documents

In total, 830 research and non-research sources of evidence were identified for possible inclusion, and of these, 164 were cited in the guidance document. See Figure 1 in the original guideline document for a flow diagram of literature search results.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

I: Randomized controlled trial (RCT) or experimental study, systematic review of all RCTs

II: Quasi-experimental study, systematic review of quasi-experimental studies or combination of quasi-experimental and RCTs

III: Non-experimental studies, qualitative studies, systematic review of non-experimental studies, combination of non-experimental, quasi-experimental, and RCTs, or any or all studies are qualitative

IV: Clinical practice guidelines, position or consensus statements

V: Literature review, expert opinion, case report, community standard, clinician experience, consumer experience, organizational experience (quality improvement, financial)

Methods Used to Analyze the Evidence

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Articles identified in the search were provided to the project team for evaluation. The team consisted of the lead author and four evidence appraisers. The lead author divided the search results into topics and assigned members of the team to review and critically appraise each article using the Association of periOperative Registered Nurses (AORN) Research or Non-Research Evidence Appraisal Tools as appropriate. The literature was independently evaluated and appraised according to the strength and quality of the evidence. Each article was then assigned an appraisal score. The appraisal score is noted in brackets after each reference in the original guideline document, as applicable.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The collective evidence supporting each intervention within a specific recommendation was summarized and the Association of periOperative Registered Nurses (AORN) Evidence Rating Model (see the "Rating Scheme for the Strength of the Recommendations" field) was used to rate the strength of the evidence. Factors considered in the review of the collective evidence were the quality of the evidence, the quantity of similar evidence on a given topic, and the consistency of evidence supporting a recommendation. The evidence rating is noted in brackets after each intervention in the original guideline document.

Rating Scheme for the Strength of the Recommendations

1: Strong Evidence: Interventions or activities for which effectiveness has been demonstrated by high quality evidence from rigorously-designed studies, meta-analyses, or systematic reviews, or rigorously-developed clinical practice guidelines

- Evidence from a meta-analysis or systematic review of research studies that incorporated evidence appraisal and synthesis of the evidence in the analysis
- Supportive evidence from a single well-conducted randomized controlled trial (RCT)
- Guidelines that are developed by a panel of experts, that derive from an explicit literature search methodology, and include evidence appraisal and synthesis of the evidence

1: Regulatory Requirement: Federal law or regulation

2: High Evidence: Interventions or activities for which effectiveness has been demonstrated by evidence from:

- Good quality systematic review of RCTs
- High quality systematic review in which all studies are quasi-experimental or a combination of RCTs and quasi-experimental studies
- High quality quasi-experimental study
- High quality systematic review in which all studies are non-experimental or include a combination of RCTs, quasi-experimental, and non-experimental studies. Any or all studies may be qualitative.
- High quality non-experimental studies
- High quality qualitative studies
- Good quality clinical practice guideline, consensus or position statement

3: Moderate Evidence: Interventions or activities for which the evidence has been demonstrated by evidence from:

- Good quality systematic review in which all studies are quasi-experimental or a combination of RCTs and quasi-experimental studies
- Good quality quasi-experimental study
- High or good quality literature review, case report, expert opinion, or organizational experience

4: Limited Evidence: Interventions or activities for which there are currently insufficient evidence or evidence of low quality

- Supportive evidence from a poorly conducted research study
- Evidence from non-experimental studies with high potential for bias
- Guidelines developed largely by consensus or expert opinion
- Non-research evidence with insufficient evidence or inconsistent results
- Conflicting evidence, but where the preponderance of the evidence supports the recommendation

5: Benefits Balanced with Harms: Selected interventions or activities for which the Association of periOperative Registered Nurses (AORN) Guidelines Advisory Board is of the opinion that the desirable effects of following this recommendation outweigh the harms

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

The Guideline for Minimally Invasive Surgery has been approved by the Association of periOperative Registered Nurses (AORN) Guidelines Advisory Board. It was presented as a proposed guideline for comments by members and others. The guideline is effective December 15, 2016.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The literature was independently evaluated and appraised according to the strength and quality of the evidence. Each article was then assigned an appraisal score. The appraisal score is noted in brackets after each reference in the original guideline document, as applicable. Also see the original guideline document for the systematic review and discussion of evidence.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

- Reduced risks of injury to patients and perioperative team members during minimally invasive surgery (MIS) and computer-assisted technology procedures
- Incorporating advancements in technology with consideration for workplace safety and ergonomics
- Appropriate management of distention media (e.g., gas, fluid) and irrigation fluid
- Refer to the original guideline document for additional discussion of potential benefits of specific interventions.

Potential Harms

See Table 1 in the original guideline document for adverse reactions to fluids used for irrigation or distension media.

Contraindications

Contraindications

See Table 1 in the original guideline document for potential contraindications to fluids used for irrigation or distension media.

Qualifying Statements

Qualifying Statements

- These recommendations represent the Association's official position on questions regarding optimal perioperative nursing practice.
- No attempt has been made to gain consensus among users, manufacturers, and consumers of any material or product.
- Compliance with the Association of periOperative Registered Nurses (AORN) guideline is voluntary.
- AORN's recommendations are intended as achievable and represent what is believed to be an optimal level of patient care within surgical and invasive procedure settings.
- Although they are considered to represent the optimal level of practice, variations in practice settings and clinical situations may limit the degree to which each recommendation can be implemented.
- AORN recognizes the many diverse settings in which perioperative nurses practice; therefore, this guideline is adaptable to all areas where operative or other invasive procedures may be performed.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Mobile Device Resources

Resources

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Safety

Identifying Information and Availability

Bibliographic Source(s)

Fearon MC, Conner RL. Guideline for minimally invasive surgery. In: 2017 Guidelines for Perioperative Practice. Denver (CO): Association of periOperative Registered Nurses (AORN); 2016 Dec. p. 629-58. [164 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2016 Dec

Guideline Developer(s)

Association of periOperative Registered Nurses - Professional Association

Source(s) of Funding

Association of periOperative Registered Nurses (AORN)

Guideline Committee

Association of periOperative Registered Nurses (AORN) Guidelines Advisory Board

Composition of Group That Authored the Guideline

Lead Author: Mary C. Fearon, MSN, RN, CNOR, AORN Department of Nursing, Perioperative Practice Specialist, Denver, Colorado

Contributing Author: Ramona L. Conner, MSN, RN, CNOR, FAAN, Editor-in-Chief, Guidelines for Perioperative Practice, AORN Nursing Department, Denver, Colorado

Team Members: Barbara L. Nalley, MSN, CRNP, CNOR, Manager, Jackson Surgical Assistants, Crofton, Maryland; David R. Urbach, MD, Clinical Epidemiology MSc, University Health Network, Toronto, Canada; James (Jay) Bowers, BSN, RN, CNOR, TNCC, Clinical Educator, West Virginia University Healthcare, Morgantown; Janice A. Neil, PhD, CNE, RN, Associate Professor, East Carolina College of Nursing, Greenville, North Carolina; Lisa Spruce, DNP, RN, CNS-CP, CNOR, ACNS, ACNP, FAAN, Director, Evidence-based Perioperative Practice, Department of Nursing, AORN, Denver, Colorado; Sharon A. Van Wicklin, MSN, RN, CNOR, CRNFA(E), CPSN-R, PLNC, Senior Perioperative Practice Specialist, Department of Nursing, AORN, Denver, Colorado

Financial Disclosures/Conflicts of Interest

No financial relationships relevant to the content of this guideline have been disclosed by the authors, planners, peer reviewers, or staff.

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Available to subscribers from the Association of periOperative Nurses Web (AORN) site.

Print copies: Available for purchase from the AORN Web site.

Availability of Companion Documents

The following is available:

- Evidence table. Guideline for minimally invasive surgery. 2016 Dec. 42 p. Available from the Association of periOperative Nurses (AORN) Web site.

Additional implementation tools, including online learning modules, videos and community discussions, are available from the AORN Web site.

Documents related to the evidence rating model, hierarchy of evidence, and expanded appraisal tools are available from the AORN Web site.

In addition, an AORN Guidelines for Perioperative Practice eBook mobile app is available from the AORN Web site.

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on March 7, 2017. The information was not verified by the guideline developer.

Copyright Statement

Disclaimer

NGC Disclaimer

The National Guideline Clearinghouseâ„¢ (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria.

NGC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or clinical efficacy or effectiveness of the clinical practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI Institute, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.